

PAGE: 1

PRINT DATE: 02/24/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
 NUMBER: 05-6-2803 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

REVISION: 1 02/06/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: MID PCA 1	V070-764400
LRU	: MID PCA 2	V070-764430
LRU	: MID PCA 3	V070-764450
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-1050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-2050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-3050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-4050

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

CONTROLLER, REMOTE POWER, 5 AMP - MID MCA 1, 2 AND 4 DC BUS A, B AND C
 POWER CONTROL

REFERENCE DESIGNATORS: 40V76A25RPC11
 40V76A26RPC10
 40V76A26RPC23
 40V76A27RPC11

QUANTITY OF LIKE ITEMS: 4
 FOUR

FUNCTION:

FOLLOWING A CREW INITIATED COMMAND, EACH REMOTE POWER CONTROLLER (RPC) CONDUCTS THE ASSOCIATED DC BUS A, B OR C POWER TO MIDBODY MOTOR CONTROL ASSEMBLY 1, 2 OR 4 FOR VENT DOOR, PAYLOAD BAY DOOR, KU-BAND ANTENNA DEPLOY/STOW, RADIATOR DEPLOY/LATCH AND REMOTE MANIPULATOR DEPLOY/LATCH MOTORS. THE RPC DESIGN INCORPORATES OVERCURRENT TRIP PROTECTION PLUS TIMED CURRENT LIMITING FOR TRANSIENT CONDITIONS. REMOTE RESET IS ACCOMPLISHED THROUGH CONTROL SIGNAL REMOVAL AND REAPPLICATION.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-6-2803 -X

- APPROVALS -

PRODUCT ASSURANCE MGR : K. L. PRESTON
 PRODUCT ASSURANCE ENGR : N. HAFEZIZADEH
 DESIGN ENGINEERING : R. L. PHAN
 NASA EPD&C SUBSYS MGR :
 NASA SUBSYS MGR :
 NASA EPD&C SSMA :
 NASA SSMA :

K.L. Preston 4/1/95
N. Hafezizadeh
R. L. Phan
[Signature] for FALCON 3/14/96
N/A
[Signature] 3-19-96
N/A

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2803 -1 REV:05/03/88

ASSEMBLY :MID PCA 1,2,3	CRIT.FUNC: 1R
P/N RI :MC450-0017-1050	CRIT. HDW: 2
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY :4	EFFECTIVITY: X X X
:FOUR	PHASE(S): PL LO X_00 X DO X LS
:	

PREPARED BY:	REDUNDANCY SCREEN: A-PASS B-PASS C-PASS	APPROVED BY:	APPROVED BY (NASA):
DES R PHILLIPS		DES <u>R. Bussard</u>	SSM <u>W.C. Stang</u>
REL M HOVE		REL <u>Richard Chilton 5/6/88</u>	REL <u>D. ...</u>
QE J COURSEN		QE <u>J. Courson 5/6/88</u>	QE <u>...</u>

ITEM:
CONTROLLER, REMOTE POWER, 5 AMP - MID MCA 1, 2 AND 4 DC BUS A, B AND C POWER CONTROL

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FAILURE MODE:
LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, MECHANICAL SHOCK, THERMAL STRESS, VIBRATION, PROCESSING ANOMALY

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL CRITICALITY EFFECT:

(A) LOSS OF ONE OF TWO MAIN DC BUS RELAY LOGIC POWER INPUTS TO THE ASSOCIATED MID MOTOR CONTROL ASSEMBLY.

(B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT FOR FIRST FAILURE - THE REDUNDANT MOTOR CONTROLLED BY A DIFFERENT RPC COMPLETES THE FUNCTION.

(C) POSSIBLE EARLY MISSION TERMINATION DUE TO LOSS OF REDUNDANCY FOR CLOSING PAYLOAD BAY DOORS.

(D) FIRST FAILURE - NO EFFECT.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2803 -1 REV:05/03/88

EFFECT(S) ON (CONTINUED):

(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL
CRITICALITY EFFECT:

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (LOSS OF
REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE TO INABILITY TO CLOSE
PAYLOAD BAY DOORS (RESULTING IN AERODYNAMIC STRUCTURAL DAMAGE DURING
ENTRY) AND/OR TO OPEN VENT DOORS DURING DESCENT (DOOR FAILED CLOSED
RESULTS IN VEHICLE STRUCTURAL DAMAGE DUE TO PRESSURE DIFFERENTIALS).
LEFT AND RIGHT VENT DOORS ARE NOT CONSIDERED TO BE REDUNDANT TO EACH
OTHER. "B" SCREEN PASSES SINCE THE FAILURE CAN BE DETECTED BY CREW
MONITORING MECHANISM OPERATION TIMES OR BY LOSS OF MCA OPERATIONAL
STATUS MEASUREMENTS AVAILABLE TO GROUND PERSONNEL.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

A,B,C,D) DISPOSITION AND RATIONALE

REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER

B) GROUND TURNAROUND TEST

VERIFY MCA OPERATIONAL STATUS INDICATORS ARE "ON" (ALL MOTOR CONTROL
RELAYS RESET) DURING NO OPERATION OF THE AC MOTOR MECHANISMS. TEST IS
PERFORMED FOR ALL FLIGHTS.

E) OPERATIONAL USE

CONSIDERATION WILL BE GIVEN TO STOWING MECHANISMS WITH THE LOSS OF
REDUNDANCY. LOSS OF REDUNDANT PAYLOAD BAY DOOR CLOSE CAPABILITY
INVOKES A MINIMUM DURATION FLIGHT. FOR LOSS OF REDUNDANT VENT DOOR
OPEN CAPABILITY, OPEN VENT DOORS PRIOR TO ENTRY.